

# **Computer Network Lab**



## **LAB WORK # 12**

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Session 2020-2024

Task 1 : Determine Network Address of the following IP Address  
IP address : 10.128.240.50/30. Also, determine broadcast and range of host addresses.

Ip Address : 10.128.240.50  
Subnet mask : 255.255.255.0 = 30

binary numbers :

10.128.240.50

10.128.240.50 : 000000110. 010000000. 11110000 . 00110010  
255.255.255.0 : 11111111 . 11111111 . 11111111 .11111100

Apply the AND Operation :

AND: 000000110. 010000000 . 11110000. 00110000

AND after we want the Network :

Network ip is: 00000110. 10000000. 11110000. 00110000  
In decimal: 10.128.240.48

Broadcast address:

Host bit: 32-30 = 2 the host bit  
000000110. 010000000. 11110000. 00110011  
In decimal: 10.128.240.51

Rang of host: 10.128.240.49  
10.128.240.50

Only two networks only

**Task 2 : Determine the network and broadcast addresses and number of hosts bits and hosts for the given IPv4 addresses and prefixes in the following table.**

IPv4 Address/Prefix	Network Address	Broadcast Address	Total Number of Host Bits	Total Number of Hosts
192.168.100.25/28	192.168.100.16	192.168.100.31	4	14
172.30.10.130/30	172.30.10.128	172.30.10.131	2	2
10.1.113.75/19	10.1.96.0	10.1.111.255	13	167
198.133.219.250/24	192.1233.219.0	192.133.219.255	8	62

**192.168.100.25/28 :**

192.168.100.25 : 11000000. 10101000. 01100100 . 00011001

255.255.255.0 : 11111111 . 11111111 . 11111111 .11110000

**Apply the AND Operation:**

**Network ip Address is :** 11000000. 10101000. 01100100. 00010000

**In decimal:** 192.168.100.16

**Broadcast address:**

**Host bit:** 32-28 = 4 the host bit

11000000. 10101000. 01100100. 00011111

**In decimal:** 192.168.100.31

**Total Number of Hosts**

192.168.100.16

^

| the center all ip is Total Number of Hosts

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192.168.100.31

//=====//=====//=====//=====//

2-> 172.30.10.130/30 :

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172.30.10.130: 10101011. 00001110.00000110.10000010
255.255.255.0: 11111111 .11111111 .11111111.11111100
```

### Apply the AND Operation:

**Network ip Address is : 10101011. 00001110 . 00000110 . 10000000**

In decimal: 172.30.10.128

Broadcast address:

Host bit:  $32-30 = 2$  the host bit

10101011. 00001110 . 00000110 . 10000011

In decimal: 172.30.10.131

## Total Number of Hosts

172.30.10.128

 $\wedge$ 

the center all ip is Total Number of Hosts

172.30.10.129

172.30.10.130

 $\wedge$ 

172.30.10.131

=====

3-> 10.1.113.75/19

10.1.113.75 : 00001010. 00000001 .01110001 .01001001

255.255.255.0 : 11111111 . 11111111 . 11100000 . 00000000

**Apply the AND Operation:**

**Network ip Address is :** 00001010. 00000001. 01100000. 00000000

**In decimal:** 10.1.96.0

**Broadcast address:**

**Host bit:** 32-19= 13 the host bit

00001010. 00000001. 01101111.11111111

**In decimal:** 10.1.111.255

**Total Number of Hosts**

10.1.96.0

^

| the center all ip is Total Number of Hosts

^

10.1.111.255

//=====//=====//=====//=====//=====//=====//=====//=====//=====//

**4->198.133.219.250/24**

192.133.219.250 : 00001010. 00000001 . 01110001 . 01001001

255.255.255.0 : 11111111 . 11111111 . 11111111 . 00000000

**Apply the AND Operation:**

**Network ip Address is** 00001010. 00000001 . 01110001 . 00000000

**In decimal:** 192.1233.219.0

**Broadcast address:**

**Host bit:** 32-24= 8 the host bit

00001010. 00000001 . 01110001 .11111111

**In decimal:** 192.133.219.255

**Total Number of Hosts**

192.1233.219.0

^

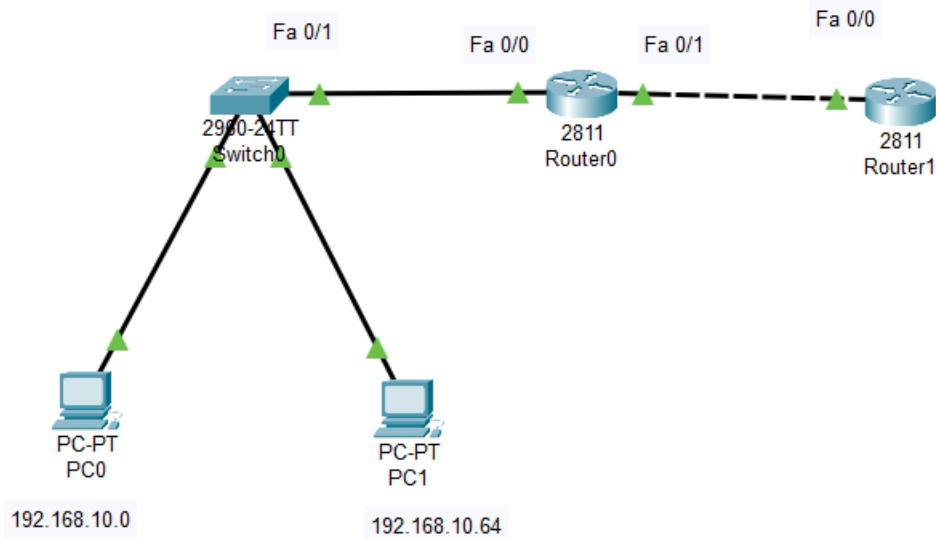
| the center all ip is Total Number of Hosts

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192.133.219.255

//=====end Q1=====//=====//=====//=====//=====//=====//=====//=====//=====//

### Q3: Network Topology A



Step 1: Determine the number of subnets in Network Topology A.

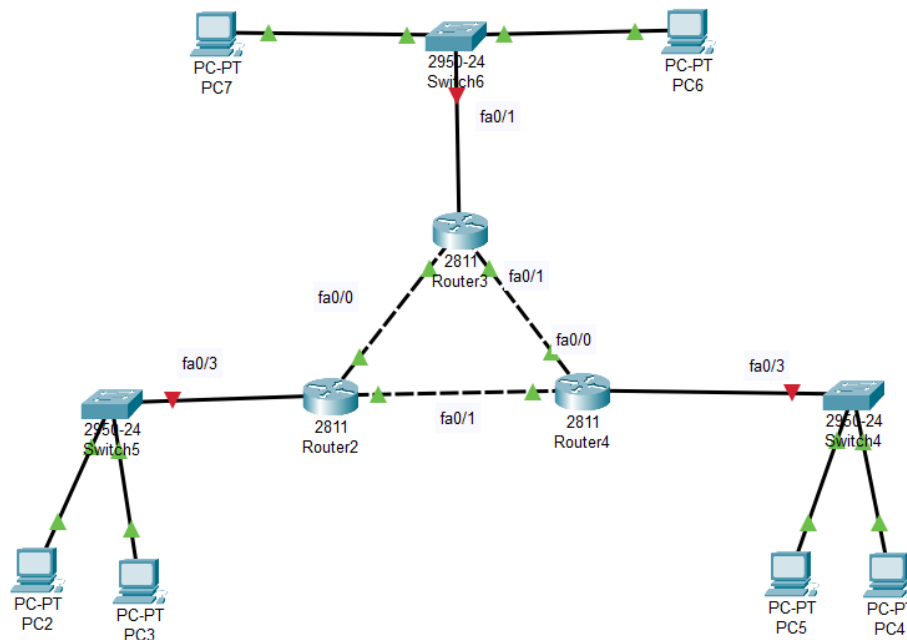
- How many subnets are there? 2
- How many bits should you borrow to create the required number of subnets? 1
- How many usable host addresses per subnet are in this addressing scheme? 62
- What is the new subnet mask in dotted decimal format? 255.255.255.129
- How many subnets are available for future use? 1

Step 2: Record the subnet information.

Fill in the following table with the subnet information:

Subnet Number	Subnet Address	First Usable Host Address	Last Usable Host Address	Broadcast Address
0	192.168.10.0	192.168.10.1	192.168.10.62	192.168.10.63
1	192.168.10.64	192.168.10.65	192.168.10.126	192.168.10.127
2	192.168.10.128	192.168.10.129	192.168.10.190	192.168.10.191
3	192.168.10.192	192.168.10.193	192.168.10.254	192.168.10.254
4				
5				

## Q4 :Network Topology B



Step 1: Determine the number of subnets in Network Topology B.

- How many subnets are there? 9
- How many bits should you borrow to create the required number of subnets? 4
- How many usable host addresses per subnet are in this addressing scheme? 14
- What is the new subnet mask in dotted decimal format? 255.255.255.240
- How many subnets are available for future use? 7

Step 2: Record the subnet information.  
Fill in the following table with the subnet information:

Network Name	Subnet Address	First Usable Host Address	Last Usable Host Address	Broadcast Address
0	192.168.10.0/26	192.168.10.1	192.168.10.30	192.168.10.31
1	192.168.10.32/26	192.168.10.33	192.168.10.62	192.168.10.63
2	192.168.10.64/26	192.168.10.65	192.168.10.94	192.168.10.95
3	192.168.10.96/32	192.168.10.97	192.168.10.98	192.168.10.99
4	192.168.10.100/32	192.168.10.101	192.168.10.102	192.168.10.103
5	192.168.10.104/32	192.168.10.105	192.168.10.106	192.168.10.107
6	192.168.10.108/32	192.168.10.109	192.168.10.110	192.168.10.111
7	192.168.10.112/32	192.168.10.113	192.168.10.114	192.168.10.115

Step 3: Assign addresses to network devices in the subnets.  
a. Fill in the following table with IP addresses and subnet masks for the router interfaces:

Device	Interface	IP Address	Subnet Mask
R1	GigabitEthernet 0/1	192.168.10.30	255.255.255.224
	Serial 0/0/0	192.168.10.97	255.255.255.252
	Serial 0/0/1	192.168.10.101	255.255.255.252
R2	GigabitEthernet 0/1	192.168.10.62	255.255.255.224
	Serial 0/0/0	192.168.10.98	255.255.255.252
	Serial 0/0/1	192.168.10.105	255.255.255.252
R3	GigabitEthernet 0/1	192.168.10.94	255.255.255.224
	Serial 0/0/0	192.168.10.102	255.255.255.252
	Serial 0/0/1	192.168.10.106	255.255.255.252